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DOUBLE COMEDO.

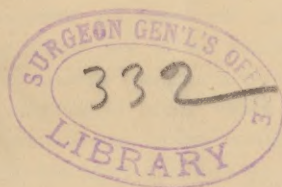
BY

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OF ST. LOUIS, MO.

Reprint:

St. Louis Medical and Surgical Journal.
January, February, March, 1888.



DOUBLE COMEDO.*

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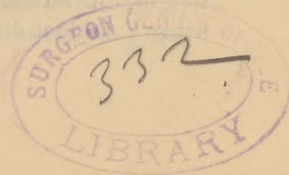
OF ST. LOUIS.

I.

It is a notorious fact that statistics in general and the statistics of skin diseases, in particular, are not only incomplete but, as a general rule, unreliable. In the case of skin diseases, it is well-known that no adequate estimate can be formed of the comparative number of cases of certain affections; and, prominent among these, are to be noted the affections of the sebaceous glands, such as rosacea, acne and comedo. There is but a very small number of such cases treated at all, and of these, only aggravated forms of the trouble, as a general rule, find their way into the hands of specialists; and it is only those especially interested in the subject who keep any statistics of diseases of the skin. On this account, it is particularly difficult to estimate the comparative frequency of comedo and, still more so perhaps, because it is such a common affection. It is now a well settled fact that like acne, it is a very common affection, making its appearance at or about the time of puberty and disappearing spontaneously, when adult life is fully entered into.

In regard to double comedo, all that can be said in respect to its frequency is that it is of comparatively frequent occurrence. Like comedo, it is not seen so often in females as in males, a fact which would seem to argue in favor of the position that the accumulation of extraneous matter exercises some influence in the plugging up of the openings of the sebaceous follicles, as men are much more subject to such influences than women. I have not taken any particular notice of the occurrence of double comedo in women, my attention having been almost entirely limited to

*Read before the Ninth International Congress, 1887.



men. At the St. Louis City Hospital I have found this affection present in about 3.5 per cent. of all the patients, and this after the examination of several hundreds of individuals whose ages ranged from sixteen to sixty-five. These observations were made at various intervals of time, sufficiently far apart to ensure at least a reasonable amount of time to allow of the rotation of a considerable number of the patients. Of course this, in strict truth, is only the percentage in male individuals who are hospital subjects, which is conclusive evidence of the fact that, taking individuals in general, the healthy as well as those not in health, the percentage of cases of double comedo must, without doubt, be still greater. Still, without actual figures to rely upon, it is well-nigh impossible to give an accurate estimate or one of value. But, even admitting that the frequency of occurrence is as low as one per cent., there can be no doubt of the relative importance of this variety of comedo, and its study is a subject which is not only interesting in itself but of sufficient importance to engage the attention of every thinking dermatologist. This is more especially true, as an investigation into its pathology and pathogeny is, doubtless, destined to shed some light upon processes occurring in other pathological conditions of the sebaceous glands, and thus, perhaps, add a little more to the meagre stock of information which we possess upon this subject.

It has been a matter of surprise to me that this variety of comedo remained undescribed until I published two preliminary notes on the subject in the *Journal of Cutaneous and Venereal Diseases*, for February and July, 1886. After that a number of dermatologists observed this condition, and some told me subsequently that they had observed it prior to my publication, but had paid no especial attention to the fact. Without desiring to impugn the motives of these gentlemen in the least, I must confess that I cannot understand this, as the very first observation made by me gave rise to quite a number of mental inquiries in regard to this variation of comedo, and excited such an interest that I regarded the fact as one worthy of record; and I understand that others have begun to study the subject, in order to elucidate it more fully and completely.

It may, perhaps, not be out of place to give a short description of this affection, which, while it may not claim the honor of being a distinct disease, is at least entitled to the position of a

variation, and a marked one too, from the typical form of a very common affection of the sebaceous glands. The appearance of double comedo, in general, is that of comedo, so far as individual lesions are concerned. We find, however, that there are *two* black points, situated near to each other, at a distance of from one to three lines, or perhaps a trifle more. The two points form a distinct pair, and, to the practiced eye, are easily recognized as forming a double comedo. Between these two points the skin is normal in appearance, with the exception of one thing, viz.: It appears to be more or less elevated, and to shade gradually, from its lateral aspect, into the normal skin (Fig. 1).



Fig. 1.

That is, the appearance presented is that which we might suppose would be produced were a cylinder, of the calibre of an ordinary pin or a little larger, and of a length equal to that between the points, introduced beneath the skin. Upon passing the hand over this portion of skin, this slight elevation can be distinctly perceived. Both points are markedly blackened, and may be situated on a level with the surrounding skin, or they may be slightly raised up with it and produce small papular elevations, or be very slightly elevated above the general plane of the cutaneous surface, thus giving the nutmeg-grater sensation which is sometimes observed in comedo. If lateral pressure be exercised over one of the black points, by means of a spatula or of some similar instrument, a plug will be forced out whose shape is cylindrical and which has a blackened end at each extremity (Fig. 2). The length of this plug corresponds to the



Fig. 2.

distance between the two black points observed before its expulsion. If we now take a pin or piece of wire, it can be easily introduced at one orifice and be caused to protrude at the other, thus demonstrating that there exists a horizontal canal (Fig. 3).

This canal is one whose shape is slightly curved, but not sufficiently so to prevent the easy introduction of a probe such as



Fig. 3.

mentioned above, even if the instrument be straight, although greater ease of introduction is obtained by giving the instrument a slight curve, corresponding to that of the canal.

In this connection, I wish to mention that I have met further modifications of this condition. There are cases in which are found not only two but *three* and even *four* comedones communicating with one another in the same manner, and a probe can be passed through any two without any difficulty, thus showing the connection existing between the various openings (Fig. 4).

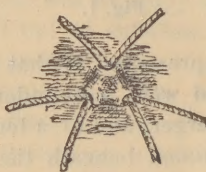


Fig. 4.

These forms might properly be designated as *multiple comedones*. Any attempt made to express the contents of any one of these varieties results either in the form of a portion of a plug, pigmented at one extremity, or of one colored at both ends. This, of course, would be naturally expected, when we consider the conditions which are present. Owing to certain unavoidable circumstances I have not been enabled to remove the portion of skin, included by the blackened points, or I might have had an opportunity of removing the underlying sebaceous mass entire. There is no doubt in my mind, however, that the condition which is present is one in which there are three or more plugs having a common center and blackened, each one at its extremity (Fig. 5),



Fig. 5, enlarged.

and consequently of a more or less digitated form. The reason for this conclusion will be developed later on.

Double comedo occurs wherever we find comedo and this is, in general terms, limited to the face, the neck and the shoulders, the back being also the seat of the disease. The principal localities affected by double comedo, in my experience, are that portion of the integument of the face, which is located over the malar eminences, or directly below them. I have never observed any upon the forehead or chin. The posterior and lateral aspects of the neck are frequently affected, more so, in fact, than other portions of the cervical area. The upper portions of the shoulders and the skin over the scapulæ are the parts of the back more frequently the seat of double comedo, although I have seen cases where the trouble was irregularly distributed over the entire dorsal aspect of the trunk. A careful examination has revealed the presence of this affection upon the chest, in but a few cases. The number is so small that its location here may be considered as being rather unusual. I have also observed it in the ears, but its location in this site is rather exceptional, as also upon the nose. I may here state, parenthetically, that the number of double comedones, in comparison with that of single ones, in any individual, is excessively small. Yet, I have seen cases in which there seemed to be no other form than the double, and this was present in large numbers.

The size of the openings of the glands in double comedo varies to some extent. The holes are often larger than an ordinary sized pin; while, at times, they are exceedingly small, so small that it is with difficulty that the wire employed for keeping fine, hypodermic syringe needles clean, can scarcely be introduced. In this fine form the bridge of intervening skin is of a marked degree of thinness, and the dark points, showing the openings of the ducts, are quite closely approximated, the distance between them being a line or even less.

II.

Before considering the pathology of double comedo, it may not be out of place to give a hasty review of the development and anatomy of the sebaceous glands, together with a short notice of the pathology of comedo. The subject of development is one which is always of the highest interest and there has been but comparatively little work done so far, in this branch on account of the vast territory which must of necessity be covered. Although the modern division of medicine into a number of special departments has given an impetus to special research, the time has been too short to permit any one to say that he has completely exhausted any one subject. It is for these reasons that I do not hesitate to say a few words concerning the development of the sebaceous glands, upon which there seems to have been but comparatively little written, up to the present time. In all literature to which I have had access, the only authors, who make any extended mention in regard to this subject, are Unna and Kölliker, and the latter is by no means as complete as he might be.

The sebaceous glands begin to make their appearance at or about the fourth month of development, in the human embryo. This is the earliest indication and we find it on the sides of the forehead. About the fifth month these glands are developing in nearly every portion of the body, and, at this period, can be found in almost every stage of development. The drawings, which are appended, are from preparations obtained from the scalp of an embryo between the fifth and sixth months, and three stages in the development of the sebaceous gland are represented. Even in a very small space we are enabled to find such examples. The reason for this has not been satisfactorily explained. As Eschricht observed long ago, this development is *pari passu* with the development of the hair and its follicle, a circumstance which would seem to indicate that the gland is a mere outshoot of the other, confirmatory proof of which is furnished by the various stages of development.

The first indication of a sebaceous gland consists in a thickening, or rather swelling, of the wall of the hair-follicle (Fig. 11). This apparently consists of a proliferation of cells, which has taken place between the internal and external layers and has thus

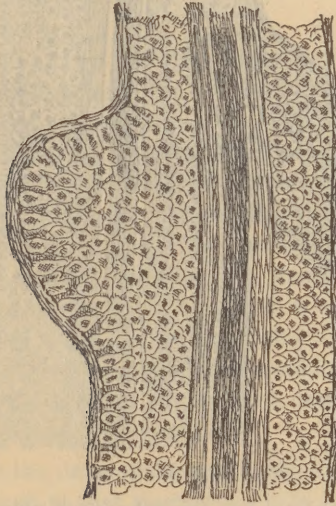


Fig. 19.

formed this boss or bulging portion. At first scarcely perceptible, it becomes more and more prominent, and pretty soon it stands out in a well-defined manner. In another and more advanced stage we find that some differentiation of form begins. A greater or less constriction takes place at a point of the projection which corresponds approximately to the *niveau* of the outer part of the external layer of the root-sheath of the hair (Fig. 17). This constriction then increases on the lower side and the entire mass apparently falls and assumes somewhat of a pyriform or flask shape, or looks like a bud growing downward (Fig. 17). In time this form becomes more or less marked until it may extend even lower down than the level of the hair-follicle; or it may never extend beyond a very slight distance from the point where the original bulging took place.

We see all of these stages well defined, and there is no difficulty whatever in tracing the relations between them. They are plainly derivatives one of the other. The scalp of a five and

one-half months' foetus will show these, especially if that portion be taken which lies directly in front of and above the ear.

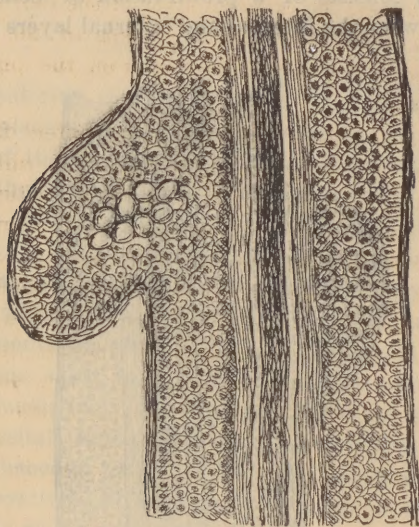


Fig. 17.

As will be shown later on, the sebaceous gland is surrounded by a very thin and apparently structureless membrane which holds a layer of cells in position. We find that, in the development of the hair, a membrane forms around the external layer of the root-sheath and when the bulging takes place, to form the future sebaceous gland, this membrane is pushed out and ultimately becomes the thin support of the walls of the gland.

The structure of the mass, which is to become the sebaceous gland, is the same, in general, as that of the root-sheath at the point where the bulging takes place. We have this boss composed chiefly of polygonal or round cells, distinctly nucleated (the nuclei being large) and somewhat closely packed together. These cells are at first continuous with those of the root-sheath (Fig. 17), but changes take place later on.

We know that the hair is an epidermal structure and that it is formed by a dipping in of the epidermis into the skin. The layers of the root-sheath correspond to those of the epidermis. After the primitive hair-cone has been differentiated the development of the sebaceous glands begins. By this time we are en-

abled to see that the innermost layer of the root-sheath corresponds to, and is continuous with the horny layer of the epidermis; in like manner, the external layer of the root-sheath corresponds to that of the lowest layer of cells of the mucous layer of the epidermis, or what becomes later on the pigment cells of the rete mucosum.

Now, it is well known that this layer differs from the other portions of the rete malpighii in the fact that whilst those portions are composed of polygonal cells of a particular character—the prickle cells—those forming the lowest layer and situated immediately over the papillae, are columnar and arranged side by side, in a very regular manner, besides which they generally contain pigment. These very characteristics, of being columnar cells and arranged in a regular manner, are observed in the lining cells of the sebaceous gland in a very early stage of its development (Fig. 17); and by exercising a little care in the examination, this layer of cells will be found to be continuous with a similar one in the root-sheath, and this latter in turn with that of the rete malpighii.

To return to the development proper of the gland: when its growth has arrived at that stage when it is pyriform, a change begins to take place in the central portion. Some of the cells begin to change in appearance, and it is noticed that fatty degeneration is beginning to take place. This goes on in all directions and in a comparatively rapid manner. After a certain time, this fatty metamorphosis, extends into the constricted portion of the mass (Fig. 18), and works its way gradually toward the internal surface of the root-sheath. When this locality is finally reached the cells, filled with oil globules, find their way between the hair shaft (which is now formed) and the root-sheath, and we have the first indication of sebum. In this process, the innermost layer of the root-sheath is destroyed at the point where the cells force their way; and we have the duct, from the sebaceous gland to the hair sac, fully established.

This, of course, is merely an outline sketch of the development of one acinus. The others are formed in a similar manner by, so to speak, secondary bulgings, and these, in turn, become pedunculated and form, each one, its own canal. The limitation of the number of lobules is probably due to the relative den-

sity of the surrounding tissues, as the more dense they are the greater will be the resistance to be overcome; and, consequently, the smaller the number of acini. Should there be but little or no

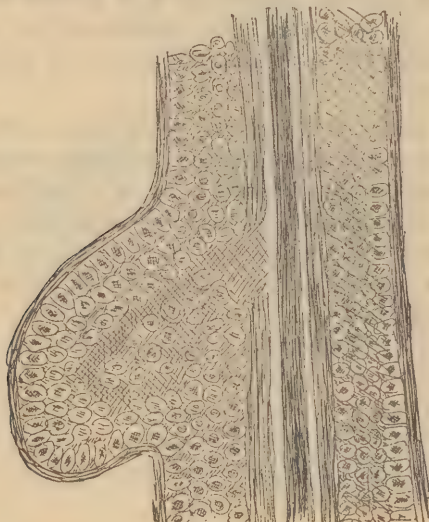


Fig. 18.

appreciable resistance in any particular direction, it may happen that the lobule forming there will become much larger than the parent and usurp, to a considerable degree, its functions.

The sebaceous gland is merely a secondary growth. It is developed from the root-sheath of the hair and only after the hair itself has developed to a certain degree. The gland depends, for its existence, upon the hair-sheath, and, although it may grow to such dimensions as to make the hair really secondary to it in importance, it still remains the offspring of the latter. This would seem to confirm the opinion, long held by many dermatologists, that these glands have for their functions the lubrication of the hairs. It is only natural that where hair has apparently disappeared, as a result of evolution, or rather, that in those localities where hair is only rudimentary, the more vital, the better nourished and more important layers of cells should thrive more; and this may in part, at least, account for the presence of large sebaceous glands in conjunction with fine lanugo hairs.

In considering the development of the sebaceous gland, it was stated that the central cells underwent fatty degeneration,

this being probably due to pressure and a lack of pabulum combined. Now, why do not the other cells also suffer this change? This is a very difficult question to answer with any degree of accuracy or of satisfaction. Yet it seems not unreasonable to suppose that the columnar cells retain a good many of the characteristics which were inherent in them, when they formed a part of the developing skin. In the mucous layer they possess a great deal of resisting power, and thoroughly guard the corium against any encroachments from without. They seem well adapted to resist pressure and this is probably the reason they escape fatty metamorphosis in the sebaceous glands. Besides this they constitute a wall and give form and solidity to this wall. They are rather cuneiform, at first, and are arranged so as to form arches, as perfect in construction as could possibly be desired. This construction, of course, greatly increases the power of resisting external pressure during the process of development of the gland. Later on, where some pressure is not only necessary but desirable, we find that the form and distribution of the cells have changed and this will be mentioned in the consideration of the anatomy of the sebaceous gland.

There is a somewhat different development which takes place in the case of glands which open directly upon the surface of the skin. Here, instead of a bulging of the hair-sheath, we have, so to speak, an absence of hair development; and, that which might otherwise have become a hair-follicle becomes a sebaceous gland, in a manner similar to that already described. A dipping in of the epidermis takes place (Fig. 19), and the lower extremity be-

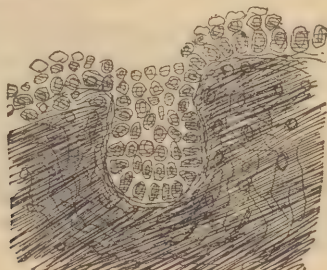


Fig. 19.

comes larger, the entire prolongation consisting, at first, of a mass of cells as in the primitive hair. The process already des-

cribed takes place and, by the further enlargement of the lower portion, we have a sebaceous gland formed, whose different acini are secondarily formed by a species of budding. The fact that the mode of development is primarily the same as that of the hair and that the differentiation takes place as it does, would seem to argue that the arrest of hair development which takes place is merely in accord with the general process of evolution which is going on gradually in man. Even in some of these glands, it is not so clear that a primitive attempt at a hair does not take place, only to be cast off without the formation of a papilla.

III.

As is well known, sebaceous glands are of three varieties: 1. Those which open directly into the hair follicle; 2. those opening upon the skin and associated with rudimentary hairs; and, 3. those opening directly upon the surface, but not associated with hairs. The minute anatomy of all of these is about the same. There is an outer envelope of a more or less structureless membrane which is supported by connective tissue. This membrane is the basement membrane of the gland and serves as a framework upon which the lining cells find support. These cells still continue to retain their characteristics; being in general, columnar with large and distinct nuclei and capable of resisting quite an amount of pressure as will be shown later on.

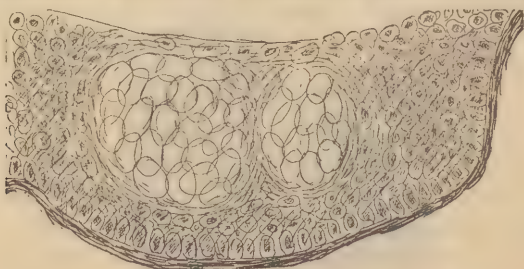


Fig. 10.

Although these cells are said to be arranged with great regularity, we occasionally find specimens in which they appear rather irregularly placed (Fig. 10). Within the line of these cells are

found numerous polygonal or roundish cells containing nuclei which are large. These cells, as the centre of the gland is approached, are seen in various stages of fatty degeneration and, sometimes, there seems to be an abrupt change from the cells to the swelled-up, bladder-like vesicles containing almost nothing but fat and very indistinctly marked nuclei (Fig. 10). The origin of the cells which are constantly appearing to undergo fatty degeneration, is a question which has, for a long time, occupied the attention of microscopists and it seems destined to be solved ere long. The whole question rests upon the solution of the problem as to whether the basement layer of columnar cells is concerned in this reproduction, or whether the polyhedral cells, nearest this layer, are productive of the proliferation. A study of the karyokinetic changes of these elements will probably furnish the required solution. Be this as it may, the greatest portion of the interior of the gland is filled with fatty matter and epithelial débris which is continually being produced, and finding its way to the outer world.

The somewhat irregular distribution and slight variations in the forms of the columnar cells, lining the sebaceous gland, are most probably due to the varying amount of pressure brought to bear upon them by the skin, under varying conditions. This also tends to produce a greater or less adaptability of the gland walls to pressure without seriously interfering with the texture of the gland; and thus afford them some aid in the expulsion of their contents. To say, however, that this expulsion is due to the action of the *arrectores pilorum* or that the movements of the skin plays any considerable part in this, seems to me to be incorrect. A much simpler explanation is that the cells nearest the duct, being the oldest, have undergone fatty degeneration much more completely than those immediately behind them and so on. As new cells proliferate, near the periphery, they exercise pressure upon those immediately in front of them, and this pressure is transmitted in the line of least resistance, and we have, in consequence, an escape of sebum into the hair follicle or upon the skin as the case may be. In the second and third varieties of sebaceous glands, mentioned above, there are no hair-muscles, and yet the sebum finds its way to the surface.

IV.

In regard to the production of comedo there seems to be some difference of opinion in respect to details. A careful consideration will show, however, that one of two causes is generally at work. One is external and purely mechanical; the other internal and, to some degree, organic. In the first, the mechanism consists simply in a plugging-up of the mouth of the duct, foreign matter becoming wedged in, so to speak. The sebaceous material behind this is unable to overcome the resistance and, as a natural result, accumulates. More or less inspissation takes place, especially of that portion in the duct and, the material continuing to increase in quantity, exercises a slow and constant pressure. If this continues long enough, the gland dilates, and its acini also, until we have the organ simply transformed into a sac, the duct disappearing more or less completely (Fig. 11).

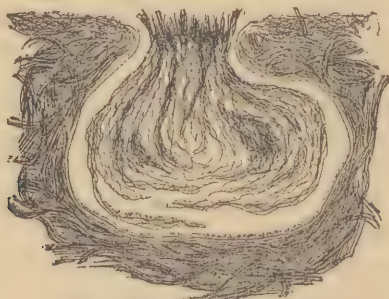


Fig. 11.

When the cause is internal, the cells do not undergo complete fatty metamorphosis and the resulting mass of each cell is somewhat hard, its envelope tough and a combination of several produces, a plugging up of the outlet of the gland. The remainder of the process is essentially the same as in the first instance given, with the exception of being perhaps a little more irritating. Extraneous matter falls in the opening of the follicle and a comedo which is extremely dry and difficult to force out is the result. It seems that, after a certain length of time, there is an apparent cessation of cell formation, and dessication goes on, the plug separating from the walls of the sac-like gland, as shown in Figs. 11 and 12, but seemingly attached to the edges of the opening of the duct.

In all the specimens which I have examined, I have found that the cavity was lined by a membrane seemingly structureless and upon which no cells could be found. They may have fallen out, but it is more probable, as Bärensprung suggested long ago, that after the accumulation of sebum has remained a long time, the secreting structure becomes lost, to a certain extent, the continued pressure producing more or less absorption. That a comedo may be old and still contain secretory cells has been demonstrated by Bulkley, but that these cells may entirely disappear has also been well established.

In double comedo, we have a condition that is the exact analogue of that found in the single variety. A large roundish cavity is found, lined throughout as in comedo and filled with a plug of sebaceous matter having two extremities, each one of which shows its darkened end at an opening (Fig. 12). The plug has

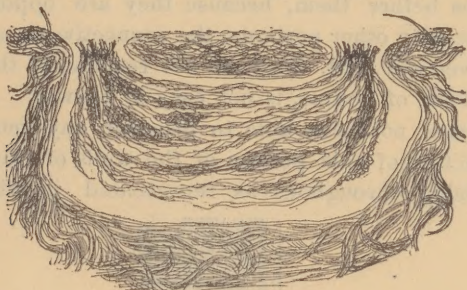


Fig. 12.

the same general characteristics as in the ordinary form and differs from it only in the fact that it has two external extremities. The manner of formation is the same as in the other, after the cavity has been established.

In regard to the formation of this cavity, there can be but one of two solutions. In the first place we must suppose a condition which I consider entirely untenable, viz.: that there is a congenital deviation in the form of the sebaceous gland—in other words, that one gland has two ducts. The careful examination of many infants and children has failed to show this condition. In adults, it has not been found in those cases where no comedo existed. Yet, the comparative frequency of double comedo is such that we might reasonably expect to find such a condition were the disease dependent upon a congenital condition of this kind. The

only reasonable solution which I can offer is this: That two sebaceous glands, in close proximity to each other, are each one the subject of comedo. In each one the inspissation is marked, and accumulation of the contents becomes such that the small amount of tissues existing between the two is subjected to a pressure such that it simply produces absorption of that septum, and fuses the two cavities into one. That there is a tendency for such pressure to exist and be produced is probable from the fact that in single comedo from the same individual, and in the neighborhood of the double one observed, there remains nothing of the internal or lining structure but the membrane already alluded to. The objections to this are the following: 1st. If this lining membrane is absorbed in both glands where they touch, why is it that it is not absorbed in other portions? This is answered by the fact that, where absorbed, these membranes cannot push other tissues before them, because they are opposed to each other; whereas, in other portions, the connective tissue surrounding them gives way. 2d. Why are not remains of this septum to be seen? This, of course, is not easy to answer. As a matter of fact, I have not been able to discover any remains of the minute structure of this portion of the walls of the glands, the condition being throughout as represented in Fig. 13. We



Fig. 13.

have here, a structureless membrane outside of which there exists a cellular layer containing fibres and, external to this, connective tissue. There is no break in the membrane at any point, nor is there any projecting tissue or portion of it. It appears all around as a homogeneous, structureless mass, of uniform thick-

ness throughout and staining a lighter color than the rest. It seems to participate in the nature of epidermal tissue in composition.

The probability of double comedo being formed by the fusion of two single lesions is rendered still greater by the fact that lesions are found in which three or four openings communicate with one common sebaceous cavity. It is more reasonable to ascribe these multiple comedones to the action of several single ones, by pressure and absorption than to suppose the existence of a number of anomalies with the necessity of having a new one to fit each new case; whereas, in the latter instance a general and simple law suffices to explain every example. The manner in which this takes place can only be determined by the examination of specimens obtained during the active period of the process, before the final condition, just described, has taken place.

